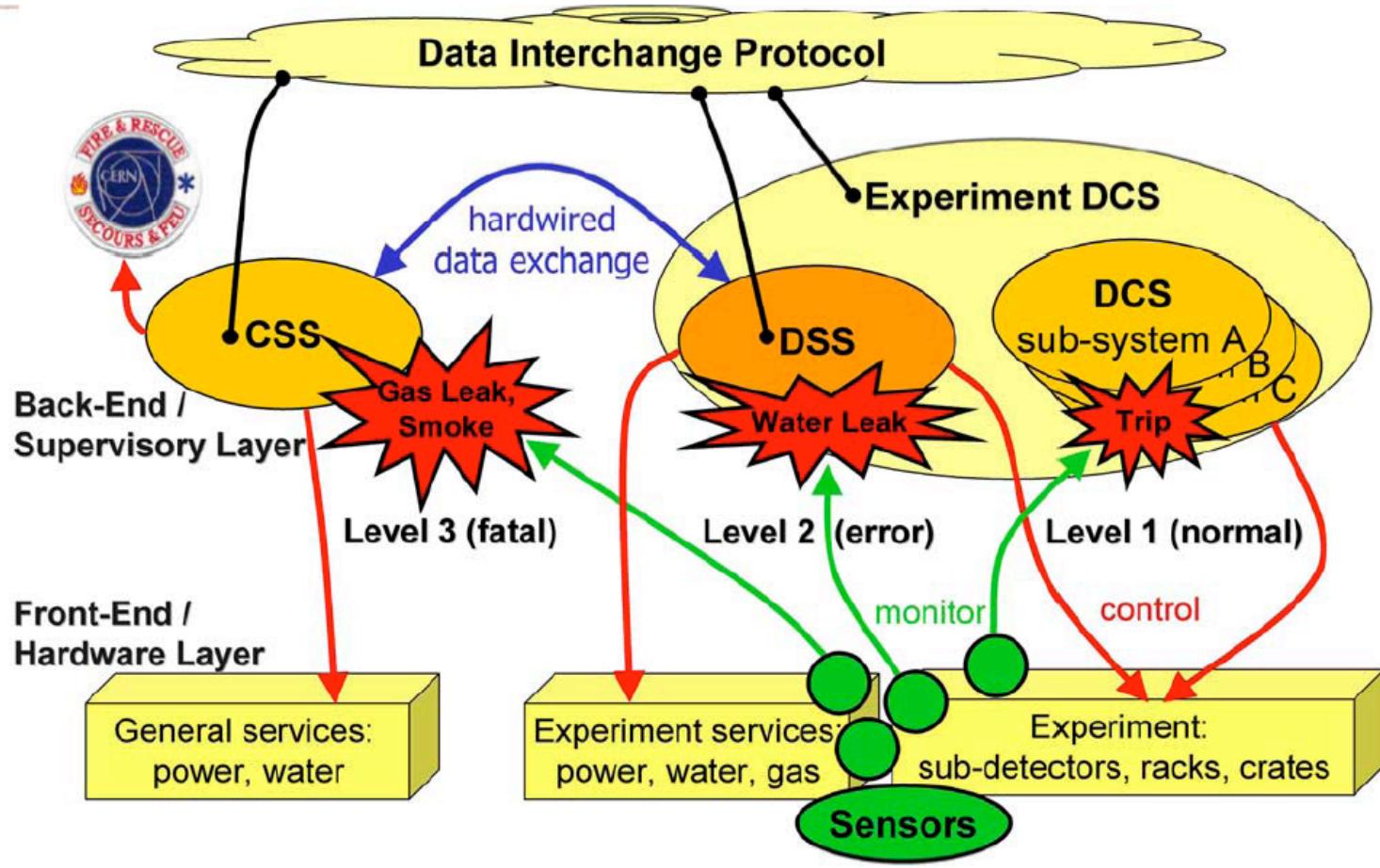
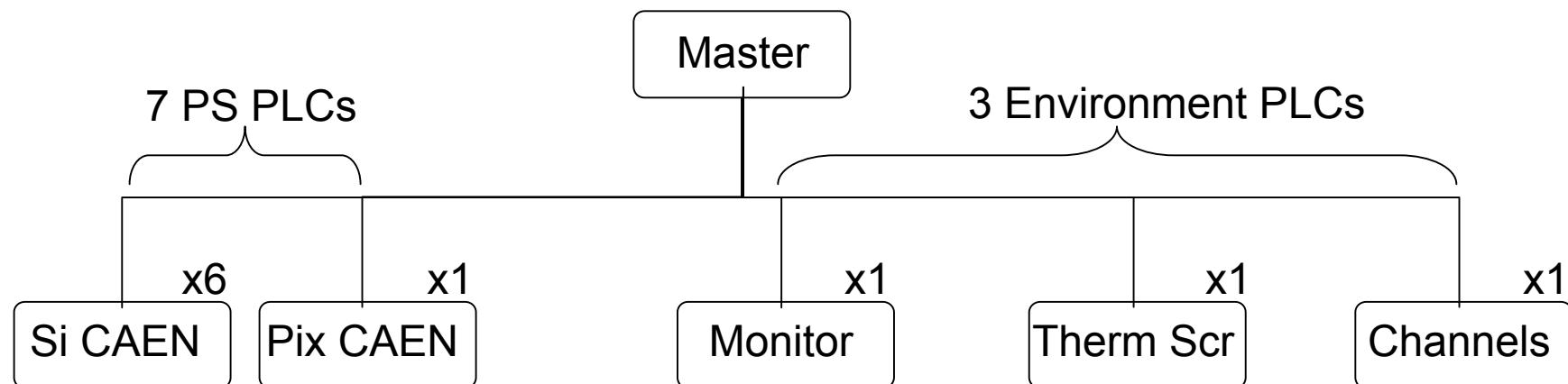


Pixel Alarms and CERN Safety System



Tracker Overview

- Pixels have defined alarm conditions and traced I/O - **doc 404-v4**
 - Initial Action Matrix for the Master Level Interlocks - **doc 2020-v1**
 - One Master PLC and 7 Slaves and 3 Env PLCs
 - Pixel slave sends heartbeat to Master, that's all.
 - Master sends one action (0,1) to 7slaves.



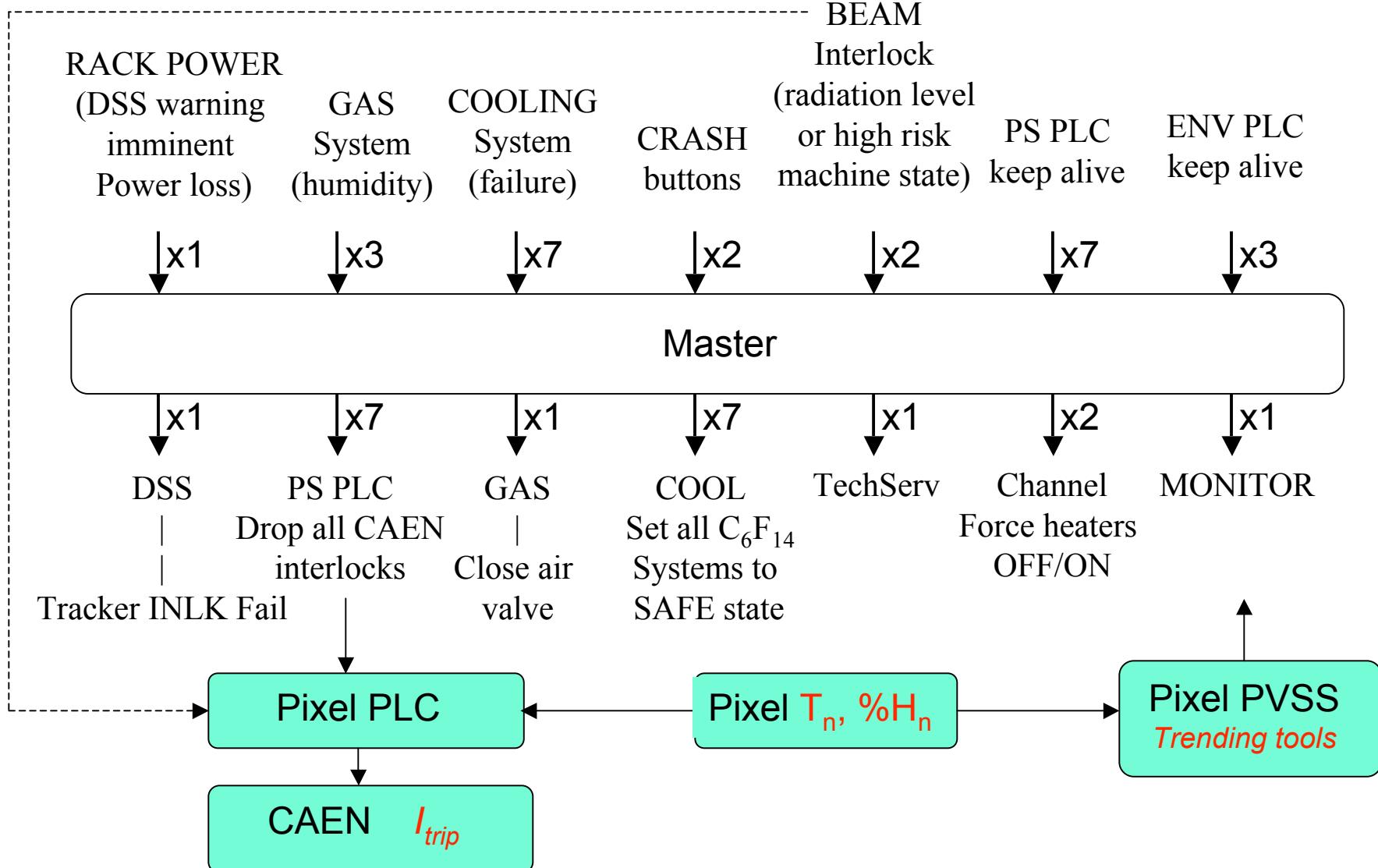
Internal temperature sensing and CAEN power supply (PS) interlocks in blocks of an integral number of cooling loops and power supply racks

Interlocks for gas
What else?
Master parameters
made visible to DCS

Control and Monitor
Thermal Screen temps
and power supplies

Master Inputs and Outputs - Diagram

- All inputs and outputs from the master are digital.



Pixel Global Alarms

FIRE ALARM USC55

FIRE ALARM ELEC RACKS

FIRE ALARM PIXEL DAQ

BEAM (Accelerator)

BEAM (BCM Alert)

POWER CUT IN USC55

POWER CUT IN CAVERN

COOLING PLANT FAILURE

FC72 LEAK IN SUPPLY LINES

N2 FLOW STOPPAGE

%H HIGH (ENV PLC)

PLC NO HEARTBEAT

THERMAL SCREEN OFF

%H HIGH (PIX PLC)

T_n over limit

I_n over limit

MINOR LEAK IN SUPPLY LINES

COOLANT FATIGUE

DB OFFLINE

CSS/DSS->Master->PixPLC-> CAEN Abort

CSS/DSS->Master->PixPLC-> CAEN Abort

CSS/DSS->Master->PixPLC-> CAEN Abort

BEAM->Master->PixPLC->CAEN Abort

BEAM->(Master->)PixPLC->CAEN Abort

DSS->Master->PixPLC-> CAEN Abort

DSS->Master->PixPLC-> CAEN Abort

Chiller(Safe)->Master->PixPLC->CAEN Abort

(Chiller(Safe)+PixPLC)->PixPLC->CAEN Abort

(DryGas+N2(Backup)+PixPLC)->PixPLC->CAEN Abort

(DryGas(Backup)+PixPLC)->PixPLC->CAEN Abort

DSS->Master->PixPLC-> CAEN Abort

TS->Master->PixPLC-> ??

HMX->PixPLC->CAEN Abort

PT1000->PixPLC->CAEN Abort

CAEN self trip

PVSS Trending

Testing+PVSS Trending

Oracle DB -> Local DB

Pixel Local Alarms

| | | |
|-----------------------------|----------------------------|---------------|
| %H HIGH (PIX PLC) | HMX->PixPLC->CAEN Abort | PVSS->Chiller |
| HV/LV Dead Short | CAEN self trip | |
| Blade Delamination | PVSS Temp Trending | |
| T _n over limit | PT1000->PixPLC->CAEN Abort | |
| I _n over limit | CAEN channel self trip | |
| Minor Leak in Supply Lines | PVSS Temp Trending | |
| Cooling Loop Failure (Leak) | PVSS Temp Trending | |

Summary

- Pixels Alarms handled by Global Tracker DSS.
- Tracing thru Pixel Global and Local Alarm Handlers.
- PVSS Trending Tools being developed (Advanced) Christian, Peter, Charles.
- PVSS communication with DSS fuzzy (Data Interchange Protocol - DIP).

DIP EquipmentMessageHandler

The CERN Data Interchange Protocol (DIP) is a system which allows relatively small amounts of soft real-time data to be exchanged between very loosely coupled heterogeneous systems. The DIPMessageHandler allows TIM to acquire data from other CERN domains using the DIP protocol.